Rain Garden Requirements and Plant List

Benefits

•Keeps rainwater and melted snow on site, so as not to overload storm sewers and cause flooding.

•Allows streams and creeks to be fed by cool groundwater at a constant rate.

•Provides a way to use and optimize rainfall, reducing or avoiding the need for irrigation.

•Because water is held for a short amount of time, mosquito breeding does not take place.

•Filters some pollutants caused by runoff from paved areas, roads and roofs.

•Encourages wildlife and biodiversity.

•Recharges groundwater, reducing the need for costly stormwater treatment structures.

Requirements

Chart 1			
Type of Soil	3-5" deep	6-7" deep	8" deep
Sandy	0.19	0.15	0.08
Silt Loam	0.34	0.25	0.16
Clayey	0.43	0.32	0.2

Application: Rain Gardens within 30' of the home or structure

Size: The size needed is determined by the area of the surface to be drained (watershed) and the type of soil present at the garden site (sand, loam, clay).

1. Measure the length and width of the roof, road, etc. Calculate the area in square feet.

2. Determine the type of soil present. Follow the instructions on the Soil Texture Worksheet.

3. Decide on the depth of your garden. A typical rain garden is between four and eight inches deep.

4. Using Chart I below, multiply the watershed area by the size multiplier given on the chart for the desired depth. Example: Your roof area is 50' by 15'=750 sq. ft. Your garden is 6-7 inches deep, and you have loam soil. Multiply 750 sq. ft. x 0.25 (the size multiplier for your soil type) to equal 187.5 sq. ft. of rain garden space required. Round up to 200 sq. ft.

Chart II shows the size of the rain garden required to absorb 90 percent of the water as a percentage of the roof area. This figure is determined by the type of soil and how fast the water is absorbed. Example: To absorb 90 percent of the runoff requires a garden 90 sq. ft. in area (or 1/5, 20 percent the size of the roof) at a rate of 0.4 inches/hour.

Chart II		
Type of Soil	Size of Rain Garden as % of Roof Area	Infiltration Rate, in/hr
Sandy	20% (5:1)	0.4
Silt Loam	30% (3:1)	0.2
Clayey	60% (2:1)	0.05

Application: Rule of thumb for controlling 90% of runoff
The infiltration rate (in/hr) = Size multiplier regardless of depth

Light: Six or more hours per day of full sun are preferred.

Water: Plants should be watered immediately after planting and twice weekly (totaling one inch) until plants are established.

Elevation/Topography: No matter what the depth of the rain garden, the goal is to keep the garden level. The garden should be no closer than 10 feet from the building/downspout and with a slope of 1-12 percent away from the building. To determine the slope:

1. Pound one stake at the uphill end of the proposed site and another stake at the downhill end of the site.

2. Tie a string to the bottom of the uphill stake and run the string to the downhill stake.

3. Using a string level or carpenter's level, make the string horizontal and tie the string to the downhill stake at the leveled height.

4. Measure the width between the two stakes (in inches) and the height (in inches) of the downhill stake between the ground and string.

5. Divide the height by the width and multiply the result by 100 to find the percent slope. If the slope is more than 12 percent, it is best to find another site or talk to a professional landscaper.

Now that the slope is known, decide on the depth of the rain garden from the following options:

If the slope is less than four percent, it is easiest to build a three- to five-inch deep rain garden.

If the slope is between five and seven percent, build the garden six to seven inches deep.

If the slope is between eight and 12 percent, build a rain garden eight inches in depth.

If the rain garden is more than 30 feet from the downspout, the lawn area that will be draining into the rain garden must also be considered along with the roof area.

Soil: Rain gardens can be built in sandy, loam or clay soils .To test simply for water infiltration: dig a hole about 6 inches deep where the proposed rain garden will go. Fill the hole with water. If the water takes more than 24 hours to soak in, the soil is not suitable for a rain garden.

Shape: A hose or string should be laid out on the grass in an attractive pattern, such as a crescent, kidney or teardrop shape, according to the calculated size. The garden should be dug with a flat bottom and sloping sides, resembling a pie tin.

Plant Materials: Select native wetland edge vegetation including forbs, sedges, rushes and grasses that have well established root systems, usually one- to two-year-old plants. Plant plugs are preferred over seeds due to flooding and wind that might make seeding difficult.

Planting and Maintenance: Dig each plant hole twice as wide as the plant plug and deep enough to keep the crown of the young plant level with the existing grade. Put the plant in the hole, refill with soil and firmly tamp around the roots to eliminate air pockets. Label plants, if desired. Mulch may be used to keep in moisture and discourage weeds.

Special Considerations

Wildlife: Selecting plants that are attractive to wildlife will make the rain garden more interesting. Butterflies, dragonflies, birds and toads are likely visitors.

Mosquitoes: Mosquitoes require one to two days to lay and hatch eggs in standing water. An additional seven to 12 days are required for the larvae to become adults in standing water (time may be shortened, depending on air temperature). Water in rain gardens seldom lasts more than four or five days, so mosquitoes are not a problem.

Plant List for Medium Soil – Full Sun

common ironweed (*Vernonia fasciculata*)
Culver's-root (*Veronicastrum virginicum*)
cup-plant (*Siliphium perfoliatum*)
downy phlox (*Phlox pilosa*)
fox sedge (*Carex vulpinoidea*)
great blue lobelia (*Lobelia siphilitica*)
Indian grass (*Sorghastrum nutans*)
muskingum sedge (*Carex muskingumensis*)
New England aster (*Symphyotrichum novae-angliae)*
Ohio goldenrod (*Solidago ohioensis*)
prairie avens (*Geum triflorum*)
smooth phlox (*Phlox glaberrima*)
swamp milkweed (*Asclepias incarnata*)
sweet black-eyed Susan (*Rudbeckia subtomentosa*)
white wild indigo (*Baptisa alba*)
wild bergamot (*Monarda fistulosa*)
wild senna (*Cassia hebecarpa*)

Plant List for Moist Soil – Full Sun

big bluestem (*Andropogon gerardii*)
black-eyed susan (*Rudbeckia hirta*)
blue flag iris (*Iris versicolor*)
blue vervain (*Verbena hastata*)
porcupine sedge (*Carex comosa*)
brown-eyed Susan (*Rudbeckia triloba*)
cord grass (*Spartina pectinata*)
Culver's-root (*Veronicastrum virginicum*)
cup-plant (*Siliphium perfoliatum*)
dark green bulrush (*Scirpus atrovirens*)
fox sedge (*Carex vulpinoidea*)
golden Alexanders (*Zizia aurea*)
great blue lobelia (*Lobelia siphilitica*)
Indian grass (*Sorghastrum nutans*)
Indian plantain (*Amoglossum atriplicifolium*)
common ironweed (*Vernonia fasciculata*)
marsh blazing-star (*Liatris spicata*)
nodding wild rye (*Elymus canadensis*)
Ohio goldenrod (*Solidago ohioensis*)
ox-eye sunflower (*Heliopsis helianthoides*)
perfoliate boneset (*Eupatorium perfoliatum*)
porcupine sedge (*Carex comosa*)
porcupine sedge (*Carex hystericina*)
prairie blazing-star (*Liatris pycnostachya*)
prairie dock (*Siliphium terebinthinaceum*)
rosinweed (*Siliphium integrifolium*)
showy tick trefoil (*Desmodium canadense*)
spongy sedge (*Carex stipata*)
spotted Joe-pye-weed (*Eutrochium maculatum*)
stiff goldenrod (*Oligoneuron rigidum*)
swamp milkweed (*Asclepias incarnata*)
switch grass (*Panicum virgatum*)
Virginia wild rye (*Elymus virginicus*)
wild bergamot (*Monarda fistulosa*)
wild blue iris (*Iris shrevei*)
wild senna (*Cassia hebecarpa*)
yellow coneflower (*Ratibida pinnata*)
yellow sneezeweed (*Helenium autumnale*)